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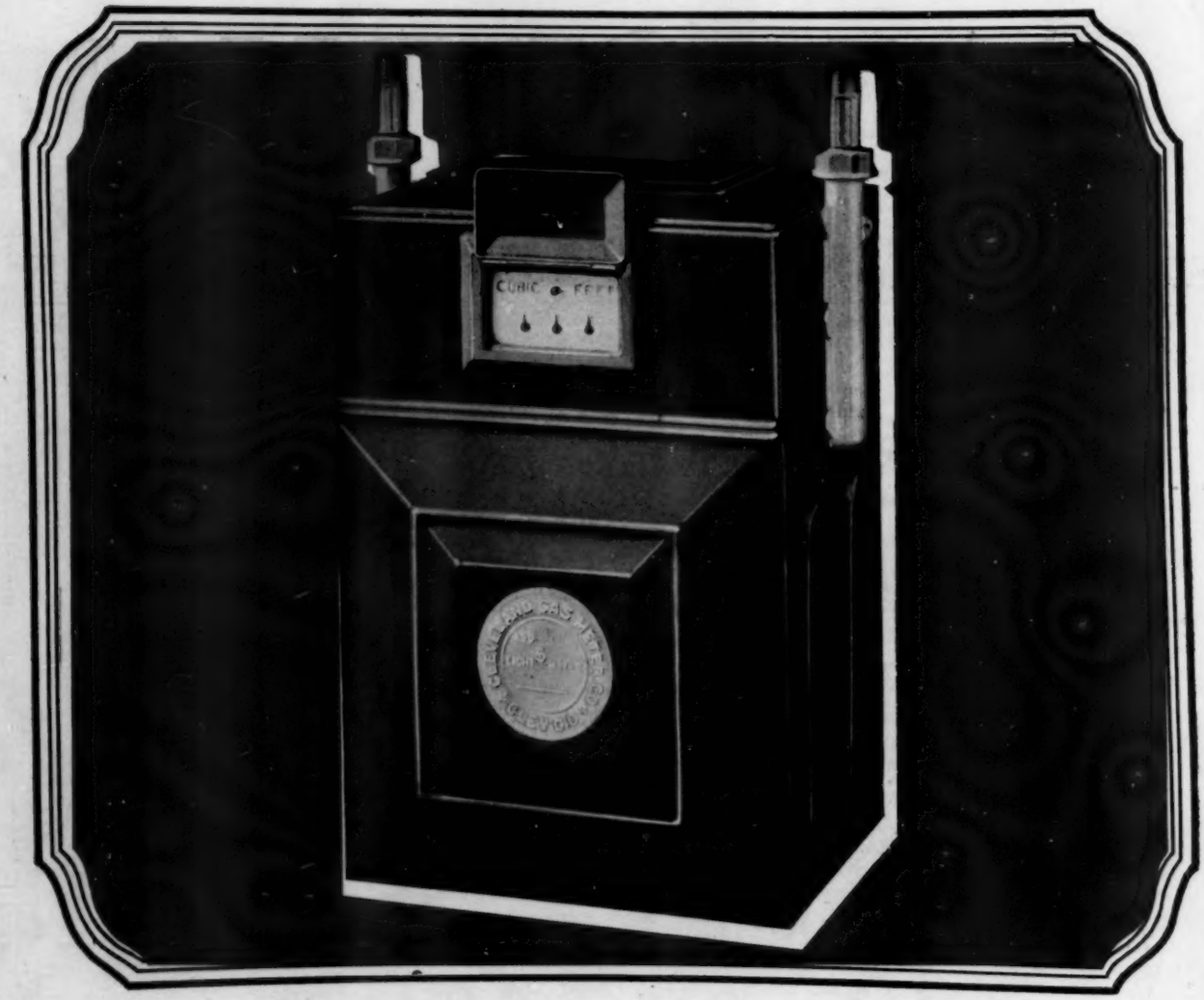

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SIXTY-FIFTH YEAR

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"APPLICANT FOR MEMBERSHIP IN THE AUDIT BUREAU OF CIRCULATIONS"

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Gas Explosions

How gas is often made the goat

A. F. Kunberger

Chief Chemist, the U. G. I. Contracting Company, Philadelphia, Pa.

IN the issue of November 17, 1923, of "Das Gas und Wasserfach," appeared an article entitled "Precaution in Dismantling a Gas Holder," by F. Breitkopf, of which I make the following short abstract:

"The report of the explosion at Arendsee during which three men lost their lives reminded me of an explosion at the Wolfenbuettel Gas Works in 1907. The old holder, being both too old and too small, had to be dismantled to make room for a new one. Although the responsibility for any accident that may have occurred while this work was done rested with the contractors, I, nevertheless, took the precaution of removing the manhole lid in the crown of the holder and also the lids on the sealpots four weeks before the work was actually started.

"The workmen began by taking out the rivets from one sheet and removing this plate. About this time, I had ascended to the crown to see how the work was coming along and I noticed a large ax lying on the crown. On inquiry, the man in charge told me that this ax was to be used to cut the sheets along the rivet seams, as taking out rivets would consume too much time. He followed this explanation by demonstrating it. No sooner had he struck the sheet than I noticed small flames shooting around inside the bell. Shouting to the men to jump for their lives, I was the last to leave the crown. I had barely reached the ground when the bell arose and flames shot through the opening in the crown."

Was It an Air-Gas Explosion?

Mr. Breitkopf continues by explaining that a workman had replaced the sealpot lids and thus the air was prevented from circulating. However, the manhole in the crown was open for four weeks and I am certain that precious little gas was left in that holder. If this had actually been an explosion of an air-gas mixture, as Mr. Breitkopf appears to think, he would not have had time to jump off himself, nor to think of causing others to do so.

In my opinion, the holder crown was covered, like most holder crowns I have seen, with naphthalene flakes. On striking it with the ax, the sparks formed by the contact of steel to steel or iron, whatever the sheets were made of, ignited the naphthalene flakes loosened by the shock and floating in the air in the holder.

Since these flakes were separated by air and, therefore, combustion was confined to each flake igniting one another, etc., it was rather harmless as long as no homogeneous air-gas mixture existed, but these burning flakes had the tendency to fall and on their descent encountered a layer of air-vapor mixture caused by holder oil covering the water left in the holder. The force of the explosion of this air-vapor mixture was dependent only on the vapor pressure of the holder oil, that is to say, the depth of the air-oil vapor layer above the oil. This, I feel, is the only reasonable explanation of the fact that after the flames were visible, six men had time to jump and watch the holder rise and hang up.

Two Other Explosions

This reminds me of two other explosions which had been attributed to gas, but on careful examination of the circumstances could easily be traced to other causes.

One occurred in Philadelphia. Some years ago we installed in one of the shops of a large linotype machine manufacturing company a number of gas-fired melting pot furnaces. One of these furnaces exploded one morning shortly after it had been lighted for the day. Three men were injured and the management attributed it to some defect in the burner or in the gas supply, causing the flames to go out and reignite on the already very hot pot.

Not a Gas Explosion

The Industrial Division of the New Business Department came to me for advice. After hearing the story that the furnace had been lighted for 20 to 30 minutes when suddenly the pot was raised, the hood door blown out, the flue connections torn off and the contents of the pot spattered all over the inside of the hood, I came to the conclusion that not gas, but some other agent, was the cause. After some inquiries, I learned that this pot had been used for case hardening small machine parts, and at the plant I found that another pot in the same room was used for bluing small steel parts. I also learned that these pots were emptied every night, the molten salts being poured into iron moulds. In the morning, after the furnace was lighted, the cakes from the molds with some fresh salts from a box kept in the room were charged into the pot. As is well known, sodium cyanide is usually used for this purpose. For bluing steel, saltpeter is usually used, and it was used in this case, I was informed on inquiry.

Chemicals Caused Explosion

The morning this explosion occurred, for some reason never explained, the man must have charged this saltpeter into the cyanide pot and it took about 20 to 30 minutes to melt the two salts together, and then they exploded. From the manager down to the foreman, nobody knew that these two salts formed an explosive mixture and for that reason no particular precaution had been exercised and the two boxes containing the two otherwise harmless salts were kept side by side.

An Explosion in Georgia

The other explosion I was asked to investigate and if possible determine the cause, was far more serious. Six persons lost their lives in the fire caused by it. The explosion took place in the basement under a drug store located in a hotel building in a town in Georgia. The State Fire Marshal had given illuminating gas as the cause of the explosion and the coroner placed the responsibility for the death of the people to the neglect of the gas company supplying the gas. Witnesses stated that for some time prior to the incident a strong odor of illuminating gas could be noticed outside the building. Afterwards, a 1¼-inch gas pipe was found under the pavement in front of the building, which, although being connected with the main, was open at one end. This was the cause of the odor.

The pipe, however, was filled with sand and clay, so that after it had been removed, only little more than eleven feet of gas per hour could be passed through the pipe and since the sand and clay, no doubt, was loosened by removing the pipe it is safe to assume that less leaked through while in place. In addition, there was several feet of soil and a new concrete wall between the open end of this pipe and the basement in question. The drug store and basement were supplied with gas through a 3 lt. meter, the service coming through a wall at right angle with the wall opposite the aforementioned pipe. This meter was in good condition after the fire.

The Details

The explosion occurred shortly after 1 o'clock in the morning, the drug clerk had changed his clothes in the basement prior to locking up the establishment about 12 o'clock, or not much more than one hour before, and at that time he did not notice any odor of gas. The passenger elevator shaft ended in this basement and the motor (an old type with badly sparking brushes) was also in this basement. No one in the lobby of the hotel, to which the air from the basement had free access, as the shaft was loosely housed by rough boards, noticed the odor of gas shortly before or at the time of the explosion.

Now, since several people were in this lobby, and the elevator door was open to the lobby, only a few minutes before, it was safe to assume that they would have noticed the odor of gas long before an explosive mixture could have accumulated. Another circumstance that convinced me that gas was not the cause was the fact that a black smoke filled the place immediately after the explosion. One eyewitness who observed the explosion from a short distance away, and some of the people in the lobby at the time, were positive in their statements that two distinct explosions in short succession took place.

A Drum of Turpentine

Among the debris was found a 50-gallon drum from which the bung screw was missing. From the drug clerk it was learned that this had on the day of the fire contained between 30 and 40 gallons of turpentine. The condition of the drum, however, indicated that it was empty during the fire, for, aside from being slightly bent in by a falling beam, it showed no marks of force, and had the liquid been inside at the time of the explosion or fire, it would have at least damaged the drum from the inside, if not blown it to pieces.

There was no doubt in my mind that these 30 to 40 gallons of light oil were the immediate cause of the explosion and at first I believed that the drum had been left open through carelessness, and had rolled off its support and emptied itself. The vapors gradually reached the motor and ignited through the sparks. This belief was strengthened by the fact that the elevator had only a minute or so before the explosion took place started for an upper floor and while still in motion was carried by the explosion to the top and jammed. The second explosion may have been caused by a barrel contain-

(Continued on page 105)

Oil Conservation and the Gas Industry

President Abell addresses Mid-Winter Conference at San Francisco

REVOLUTION in the manufactured gas industry in America is almost a certainty of the immediate future, since it will be called upon to replace the nation's failing supply of oil with gaseous fuel for industrial heating demands. This prediction was made by Harry C. Abell of New York, president of the American Gas Association, in his opening remarks before the mid-winter meeting of gas company executives.

Mr. Abell based his prediction on President Coolidge's recent action in the creation of the Federal Oil Conservation Board. He interpreted this to mean rapid and probably drastic curtailment of the use of oil in industrial heating processes, where it now furnishes perhaps 90 per cent of the fuel supply where gas could be used.

Supply of Oil Will Last Twelve Years

"The estimated available and usable supply of oil in the United States is nine billion barrels, and the present rate of annual production 750,000,000 barrels," Mr. Abell said. "It is apparent, therefore, that the supply will last only twelve years. A strict conservation program national in scope seems to be the only solution, and such a program means that the industrial plants of the nation will be obliged to turn to manufactured gas for their fuel requirements.

"This means that in ten years the gas output will increase at least 100 per cent, and probably a great deal more, and twenty million customers will be connected to the mains of gas companies."

Mr. Abell warned his hearers of the tremendous task ahead in preparing to satisfy this demand, to provide new methods of generation, and even to build the requisite additional gas manufacturing equipment. The gas industry, he said, has but reached the first rung of the ladder. Another problem that must be met and solved, he said, was such adjustment of rates to the public that each customer shall pay the costs he causes the company, and not force the industrial user to pay not only his own share, but also the losses incurred from those who pay less than their share.

H. C. Abell
President of the American Gas Association

An Era of Unprecedented Expansion

"The gas business is facing an era of unprecedented expansion," he said. "Sales of gas last year were more than four hundred billion cubic feet, an increase of twenty billion cubic feet over 1923, and an increase of one hundred billion cubic feet in the last six years.

"Progress during the last two decades has been a record of peak after peak, with three times as much gas consumed during the last ten years as during the preceding ten. The acceleration of increase in the more recent years is evident from the fact that, while industry doubled itself during the first fifteen years of the twentieth century, it has nearly doubled even that figure in the last eight years. Another striking fact is that, while the household use of gas increased 100 per cent in the last ten years, the use of gas in industry jumped 1,000 per cent.

Use of Gas in Industry

"This remarkable growth has been based in part on the industry's conservation of the world's natural resources. No matter what the fuel is, we cannot burn it until it has first been transformed into a gas. The gas industry, therefore, labors in-

(Continued on page 105)

Financing Public Utilities *

A detailed analysis of the financial structure of a public service company

Samuel T. Bodine

President U. G. I. Co., Philadelphia, Pa.

AS an adequate survey of the methods of financing of public utilities would occupy far more than the allotted time, this talk will be limited to a cursory, non-technical review of the elementary principles necessary to the laying of a proper foundation for such further study as you may care to pursue.

General Classification

It will suffice here to recall to your minds the general classification of the instruments of corporate finance:

1. Shares of stock, representing the interest of the owners, the stockholder being part owner in the enterprise to the extent that the number of shares held by him bears to the total number of shares outstanding.

2. Bonds and other certificates of indebtedness, such as notes and debentures, representing borrowed money, the holders of which are merely creditors, with a money claim against the corporation, sometimes secured, sometimes unsecured.

Let us consider these instruments of finance in their historical order:

Capital Stock

In the early days of public utility development, the most usual capital security was stock (not yet known as common stock to distinguish it from preferred stock, a later development), this stock representing the investment of the proprietors. When additional capital was required to carry on and develop the business the proprietors were often unable to put in large additional amounts and were unwilling to bring in outside interests in the management through the sale of stock carrying full voting rights. This led to reliance on borrowed money which had the added advantage that, when invested in the business, it would produce earnings in excess of the interest charges payable thereon, which earnings would then be available for dividends to the holders of the stock, the reason for this being that lenders of money not running as great a risk of loss as stockholders are willing to accept a lower rate of return.

Bonds Secured by Mortgage

The most usual method of permanent, as distinguished from temporary, financing through borrowed money was to issue and sell bonds secured by a mortgage for a specific amount on all property then owned or thereafter acquired, the debt having a definite due date, 20, 25, 30, 50 years hence, or longer, all of the bonds being initially issued or a portion reserved for future issue as improvements and additions were made to the property. These early mortgages were known as "Closed Mortgages," closed, because the aggregate of bonds which might be issued thereunder was limited to a specific amount so that as the enterprise expanded and new capital (for which no bonds were issued) was obtained to acquire additional property, the security back of the bonds increased by the value of such additional property.

Now, a utility, unlike an industrial, except to a minor degree, cannot limit the extensions which it must make, and must continually expand to meet the demands of the public for service; furthermore, its extensions must be paid for almost entirely through new capital, the earnings remaining after payment of dividends to the stockholders not being sufficient to pay for such extensions. This is proper, as present consumers should not be taxed through higher rates for facilities required largely to take care of the future growth of the business and additional consumers. Due to this fact, as well as higher construction costs and greater expansion of the business than was anticipated, the limit of bonds which could be issued under a closed mortgage was rapidly reached, generally many years prior to maturity of the bonds, so that it was necessary for the companies to finance themselves through the issuance of second, even third, mortgage bonds, which could not be marketed as advantageously as first mortgage bonds. In addition, these closed mortgages with fixed interest rates did not lend themselves to the variations in the money market, large discounts or premiums, as the case might be, often making the sale of bonds prohibitive.

Open End Mortgages

This situation, together with the realization that funded or bonded debt is of a permanent nature and will not be paid off at maturity but refunded by further issues of bonds, led to the adoption of the so-called "Open-End Mortgages," under which

*Lecture before School of Commerce, Temple University, Philadelphia, Pa., November, 1924.

(Continued on page 103)

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

Merchandising Memos.

NATURALLY, if you want your business to keep you, you will have to stick pretty close to it, but do not get near-sighted; get about a bit to see what other merchants are doing, as you will get many ideas in this way that you can cash in on.

Show Cards and Other Items

YOU don't have to use show cards unless you want the extra sales that they will bring.

Very few 100 per cent salesmen are developed by 50 per cent employers.

When you hear it said of a salesman: "Yes, he's a good man—but he will not stick, he's a drifter"—

consult the cashier. Maybe he was making more commissions than the boss and a new plan of compensation was proposed to him.

Know your stuff—and if you don't know, never admit it to the customer, but at least say: "Just a moment; I am not quite sure about that point." Then get the facts. Not knowing all there is to know about a gas-burning appliance frequently loses a sale. If you don't know, find out!

Customers often become disgruntled because they have to wait five minutes, even if they "only wanted to ask the price of that range in the window." A nod of the head often keeps the customer in a happy frame of mind while he waits. Everyone likes to have attention!

Window Selling—The Gentle Art of Attraction

PLAN your campaign and campaign your plan to completion.

Avoid over-elaborate displays. Simplify your scheme of decoration as much as is possible.

Remember, you are appealing to the eye and that too elaborate displays distract rather than attract the attention of folks passing the window.

Freak backgrounds cause the eye to wander from the merchandise.

Keep "whitner" signs off the windows; also strips of paper. They distract.

Have a new, neat, clean window display for Sunday window shoppers. Put it in Friday night so you can cash in on Saturday spenders.

Good lighting arrangements and purity of light are fine selling agents.

For effect, use a spotlight, with color screens. Different colored merchandise should be treated with different lighting effects. You are always safe, though, with a plentiful supply of pure white light in your windows; but on the merchandise, not in the spectators' eyes.

Keep your windows spotlessly clean and do not get your display too high. Folks seldom glance above their heads.

Price Tickets

DO not hesitate to use neat price tickets on the merchandise you display. They often neutralize the timidity which exists in a large number of window shoppers. Display creates a desire and known prices often clinch the sale. Men buy a raft of merchandise from windows.

Get out of the crepe paper class for window coverings. An expensive gas range looks out of place on a green crepe paper floor. Make your setting equal to your product. Such a setting enhances the

merchandise. And then think how many, many times you may use "real trimmings!"

Back up your window display with a good interior display—tie one into the other, where possible, and expose everything you have to sales, exhibit all merchandise and price it.

Psychologists say the average person cannot attend to more than five units at a time. This seems more than reasonable and is a good reason for confining window displays to single lines, if results are to be obtained. Getting attention concentrated is the big idea, as we are not apt to create a desire until this is done, and unless we create desire we will not lead folks through the front door and into the store.

Organization of Sales Promotion

WORK done by the gas companies in the home of the customer is being given more and more attention each day and while there have been numerous plans offered as suitable for this very important and essential work, very little has been said regarding the actual work.

In one city that we know the home service work comes directly to the attention of the general manager through the sales or commercial manager, while in another the general manager personally directs the home service work. Either method is good; in fact, any method that gets to and cultivates the friendship of the customer is GOOD. It is not our intention to say which plan of operating is most effective. Our idea is to tell of a plan that will and has operated, and of some of the experiences of a young lady who has, under the title of demonstrator, been doing home service work for a number of years, and, as we see it, doing it well.

This plan of organization, which works, is built along the lines indicated by the accompanying chart.

Sales Promotion Department

Plan of Organization

Duties of Manager

To plan all selling effort (includes store and window display and the actual writing of advertising), to work with salesmen and home service work; to follow up industrial work; to plan all advertising and place it; to direct all work in the department and co-operate with all salesmen and all other departments of the company.

Territories

The city to be divided into two territories at present: No. 1 to include all that part of the city east of east line of 15th street, and No. 2, all that part west of the east line of 15th street.

Duties of Home Service Branch

To follow up new range installations, high bill complaints, to hold cooking demonstrations and to work with the customer from a service standpoint.

Duties of Salesmen

To canvass (house-to-house) his territory and to follow up consistently and continuously all prospects developed and to make (cards) reports on all customers visited, daily.

Compensation

Salesmen to be paid a monthly salary (guaranteed drawing account) and a commission to be agreed upon on all sales coming out of their territory or originating from calls made by them upon customers in their territory and which are closed in the office, with the following exceptions:

A—No commission will be paid on industrial or commercial sales developed and closed by anyone other than the salesman himself, regardless of territory.

B—No commission will be paid on office sales to customers who have not been called upon by salesmen within a period of thirty days, and evidence of call having been made appearing on sales card.

Bonus to Service Men

In order to promote initiative and co-operation, employees of the distribution department will be paid a bonus of $1 for each and every prospective customer turned in to the manager of the sales promotion department in writing and to whom sale is made within thirty days.

WHAT WILL 1,000 CUBIC FEET OF GAS DO?

Recent wide interest in obtaining the greatest heating values for the money expended for fuels, both in homes and industry, and the prominence which manufactured gas has attained as a concentrated heat medium, has set engineers busy figuring out just what a thousand cubic feet of gas will do.

Experimenters connected with The Peoples Gas Light and Coke Company have arrived at some interesting figures as to what a thousand cubic feet of gas will do in the way of cooking. Here are some of them:

Boil 275 gallons of water.

Prepare 18 meals for six persons in the home.

Bake 50 one-pound loaves of bread in the home.

Roast enough coffee to last a person drinking two cups a day for 70 years.

Barbecue enough ham to make 1,750 sandwiches.

Prepare 330 single meals in a restaurant.

Broil 70 three-pound steaks.

Incidentally it was found that a thousand feet of gas would bake 500 brick, light two cigars a day for 500 years; do the work of two hens in hatching eggs; japan 3,600 talcum powder cans; melt sufficient lead to make 375 feet of cable covering or heat enough water for 1,000 days for shaving.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

Production and Use of Coke

DR. CARL BUNTE has published a long, interesting article on the conditions that govern the production and the utilization of coke. The article appeared in the German gas journal, Das Gas und Wasserfach. It is pointed out that gas companies must pay some attention to the properties and character of the coke they produce if they are to be able to sell it and obtain a good price for it. Poor quality of coke, he says, is caused in the first place by the use of low-grade coals. He outlines a number of methods which he recommends for improving the quality of coke.

In the first place, fresh coal should be gasified. The coal seems to produce better coke, the more quickly it is used after being mined.

Uniformity of size of the pieces of coal is also important.

It is also advisable to mix high volatile bituminous coal with lean coals.

In mixing the coals it is necessary to avoid irregular mixing according to the character of the coal and its fineness. Irregular mixing produces fissures in the coke structure.

The gasification of the coal should be slow and the furnace temperature should not be too high; the tendency to increase the gas production of the ovens or retorts by overloading the latter and operating at high temperatures results in the production of a poorer quality of coke.

The treatment of the coke in quenching is also of highest importance from this standpoint.

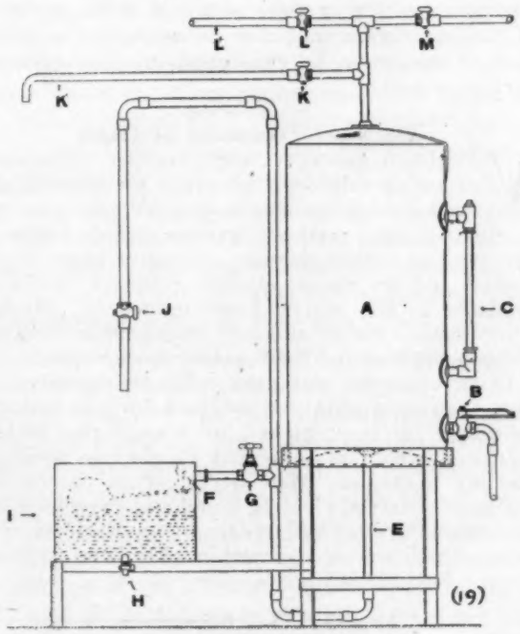
Coke with as little water content as possible is to be striven for.

Automatic Gas Sampler

SAMPLING of gas in a gas works is a matter to which proper thought should be given. It matters really but little how much care is taken with the analysis of the gas if the sample is not representative of the make. Certain gases, such as coal gas and water gas and other manufactured central station gases, require samples to be taken over a twenty-four hour period in order to obtain accurate results. Actual tests have shown that unless a continuous sample of the gas is taken, the analysis will not indicate the composition of the actual gas made during the twenty-four hour period. The error is as liable to be plus as likely as minus.

According to J. H. Goldsmith, in the Gas Journal. 1924, page 847, various methods are used for securing a sample of gas over a long period of time, such as by the use of aspirators and test holders. But these are not ideal, because the rate of sampling varies and therefore a truly representative result is not obtained. An apparatus has been devised which appears to have overcome the difficulties surrounding the taking of a representative sample of gas. This apparatus is shown in the accompanying illustration.

With reference to the accompanying diagram, the apparatus consists mainly of a container A of about five cu. ft. capacity. This is filled with water by the valve B; arrangements being provided for completely removing any gas left from the previous sample. The water is then allowed to run out through the pipe E at a uniform rate, by means of



An Automatic Gas Sampler.

the tank I fitted with a ball valve F. Gas is drawn in by pipe L; and the rate of flow of the water from tank I is controlled by valve H, which can be adjusted to suit requirements, allowing the container to be filled with gas over any number of hours. Should the water run off too quickly, due to the valve H not being adjusted properly, and the container be filled quicker than expected, pipe E acts as a seal, and thereby prevents any loss of gas when the container is full. The apparatus is fitted with a water gauge C, enabling the amount of gas in the container to be seen instantly; and a suitable arrangement of overflow and testing pipes is provided.

Tests were made to determine if the difference due to the gas standing over water was appreciable; and the results of these tests are given below. A sample of coal gas was drawn into the container over a period of two hours, the calorific value being taken

every quarter of an hour while the gas sample was being taken. The sample was allowed to stand for a quarter of an hour. The calorific value was taken, and the sample left in the container for twenty-one hours.

Results from Vertical Retorts

IN a recent paper read before an association of gas engineers in England and thereafter published in the Gas Journal, 1924, page 715, there is given an interesting account of the conditions that affect the operation of vertical gas retorts. The steaming of the retorts is described in detail and is considered an important step in the operation of the continuous type of vertical retort. The conversion of steam into gas in the retorts calls for higher temperatures and hence the materials that are used in the making of the retorts must be so chosen that they can resist this high temperature. In the original article many curves and tables are given showing the results that were obtained in the operation of the installation, and also indicating the important factors that must be controlled in the working of vertical retorts.

Electrical Treatment of Gases

VARIOUS products are obtained by treating gases or mixtures of gases by electric arcs, sparks, or silent discharges. Water gas when so treated yields methane, carbon dioxide and water vapor. The carbon dioxide and water vapor are removed, and the carbon dioxide returned to the gas producer to be converted into monoxide. Methane when treated either alone or with carbon monoxide yields acetylene and hydrogen or water vapor.

In an example, water gas may be passed at 250 deg. C. over a catalyst obtained by the action of acetylene on iron, nickel, or manganese, yielding methane, which is subjected to electric treatment yielding acetylene. The acetylene is passed over the same catalyst, yielding liquid and gaseous hydrocarbons. Purifiers or condensers are interposed between the successive reaction chambers. (British Patent No. 223,543.)

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CUSTOMERS' CREDIT

As has been previously announced, the report of the Committee on Credits and Collections at the Santa Barbara Convention led to the endorsement by the association of a procedure whereby credit information concerning individual customers would be interchanged by our member companies, to the effect that if a favorable report should be received from the company which last served the applicant for service, service would be rendered without the requirement of a deposit.

Several companies are flirting with the idea, but as far as we know the only company using it extensively is the Portland Gas and Coke Company. In Portland the policy is felt to have been of material benefit in a public relations aspect, as it permits of better and quicker service to the applicant. Furthermore, it has not resulted in any measurable loss, but, on the contrary, has often resulted in the collection of closing bills for other companies.

During the discussion of this matter at the convention it appeared to be the opinion of a representative of a California company that the rules of the California Railroad Commission required that a deposit be collected from all non-property owners not furnishing a satisfactory guarantor, and that therefore a trial of this suggested policy would not be permitted. The commission rules in this regard are too long to quote here, but the basic thought in them is that a company may require an applicant for service, to satisfactorily establish his credit. In order to protect the public, the rule goes on to state four cases in which the company must consider this credit established. The fact that the commission has defined four cases in which credit may be established does not restrict the company from adding to this list if it so desires, so long as no discrimination is practiced.

As The Journal Views It

THE APPLIANCE AND INDUSTRIAL GAS

The history of gas and its development from its original semi-mysterious status to the position that it occupies today, both in the domestic and industrial field, have been very closely connected with similar development, improvement and perfection of gas appliances. Unquestionably, gas could not have attained its present state of progress if it had not been that similar advance took place simultaneously in the designing and construction of gas appliances. While gas possesses unquestionable benefits as a fuel, it is impossible to take advantage of these intrinsic, advantageous properties unless the appliance in which gas is used has been properly designed.

Thus, gas men who have been concerned with the sale of gas for domestic purposes know well the difficulties that surround the problem of universal use of properly designed appliances in the homes of the domestic customers. There are many manufacturers who, of course, have given careful attention to this matter, and who produce domestic appliances constructed along proper scientific lines which yield the good results that are expected from gaseous fuel. These manufacturers, who have grown up with the gas industry and have developed simultaneously with it, have been of considerable assistance in promoting the cause of gas. It is only through proper co-operation and correctly directed effort of both that real progress can be made in the gas field.

However, there are certain domestic appliances on the market today which are not properly designed for the use of gas, and the commercial manager of many a gas company can testify to the fact that the use of such appliances by the consumer gives rise to most adverse criticism, not so much of the gas-burning range or water heater, but of gas itself.

In the industrial field, which, of course, is one of more recent origin than the domestic field, the same conditions apply to a certain extent. There is a tendency for manufacturers of products in which heat is used to try to build their own furnaces and appliances, and to expect to receive from such poorly constructed devices the good results that the industrial gas salesman guarantees can be obtained with gas.

This is a great danger, for once such apparatus is used and proven to be unsatisfactory, it is not so much the appliance that will be blamed as the fuel itself. There are many manufacturers of industrial gas appliances who have given serious attention to the design of the products they sell. They experiment extensively to determine how best to construct a gas-burning appliance so that the most efficient result can be obtained. From their experience along these lines they have learned that the problem is by no means a sinecure and that the building of a gas apparatus that will give good results with gaseous fuel is something that requires considerable study and much practical knowledge.

The question of control of industrial gas appliances is, therefore, a very important one. The gas companies themselves can aid by recommending appliances for industrial purposes that they know have been designed with due consideration to scientific principles. They can aid by discouraging the attempt of any industrial gas prospect to design and build his own furnace or other device in which gas is to be used, and from which the best possible results are expected.

The industrial gas business is practically in its infancy, and this is the time in which action should be taken in order to avoid the same experience that has been had in the domestic field. The industrial gas business does not want any wildcatting in industrial appliances. It cannot progress unless the appliances that are used by the industries are not only properly designed, but installed under the expert supervision and regulated by engineers, so that the optimum results can be obtained. These are essentials.

Before leaving this important subject we must take this opportunity of lauding highly the project of the National Testing Laboratory for Gas Appliances, which has been furthered by the American

Gas Association. Such a laboratory can go far towards removing the menace—for such it must be called—that threatens the industrial gas business through the infiltration and use of appliances for industrial gas purposes which have not been designed by men who understand gas and its properties.

Manufactured Gas in 1923 Census

THE Department of Commerce announces that, according to the data collected at the biennial census of manufactures, 1923, the establishments engaged primarily in the manufacture of gas and its by-products reported a total output valued at $450,096,822, an increase of 9.5 per cent as compared with 1921, the last preceding census year.

Of the total value of products, $394,507,469, or 87.6 per cent, was contributed by gas; $31,952,124, or 7.1 per cent by coke and other by-products of gas manufacture; and $23,637,229, or 5.3 per cent, by receipts from rentals and sales of lamps and appliances. On the other hand, a considerable amount of gas was produced in by-product coke plants, the value of the gas thus reported outside the gas industry for 1923 having been equal to approximately 13 per cent of the total value of the gas reported for the industry as classified.

Of the 939 establishments reporting for 1923, 82 were located in Pennsylvania, 78 in New York, 63 in Illinois, 59 in Michigan, 56 in Iowa, 51 in California, 49 in Massachusetts, 44 in Indiana, 36 in New Jersey, 34 in Wisconsin, 24 in Missouri, 22 in Connecticut and 21 in North Carolina. The number of plants in the remaining 36 states and the District of Columbia ranged from 1 to 20, and aggregated 320. In 1921 the industry was represented by 954 establishments, the decrease to 939 in 1923 having been due to consolidations.

The statistics for 1923 and 1921 are summarized in Table 1, below, and detailed statistics of products and principal materials are given in Table 2. The figures for 1923 are preliminary and subject to such corrections as may be found necessary upon further examination of the returns.

Table 1—General Statistics for the Industry, 1923 and 1921

	1923	1921	Per cent of increase (a)
Number of establishments	939	954	-1.6
Wage earners (average number) (b)	42,282	34,956	21.0
Maximum month	Nov. (c) 43,830	Jan. 36,814	...
Minimum month	Mar. 40,937	Dec. 34,333	...
Per cent of maximum	93.4	93.3	...
Wages	$59,600,334	$53,306,407	11.8
Cost of materials	191,120,082	202,253,479	-5.5
Products, total value	450,096,822	411,195,503	9.5
Value added by manufacture (d)	258,976,740	208,942,024	23.2
Primary horsepower	358,605	(e)	...
Coal consumed for all purposes:			
Anthracite (long tons)	1,245,672	(e)	...
Bituminous (short tons)	7,276,939	(e)	...

(a) A minus sign (-) denotes a decrease.
(b) Not including salaried officers and employees nor proprietors and firm members. Statistics for these classes will be given in final report.
(c) Same number reported for October.
(d) Value of products less cost of materials.
(e) Not reported.

(Continued on page 107)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 56

Change of State *(continued)*

The General Equation

BEFORE considering a specific case, it will be well to establish the general equation. If the mass of the body at the higher temperature be assumed to be M_1, the temperature of this body t_1, then in order to be able to express the amount of heat, the number of British Thermal Units, contained by that mass at the given temperature, it is necessary to know its specific heat, which may be assumed to be s_1. Hence the total number of British Thermal Units in that mass is given by the following expression: $M_1 \times t_1 \times s_1$.

Heat in the Colder Body

Let the mass of the colder body be designated as M_2, its temperature as t_2, which is less than the temperature t_1, and the specific heat of this body as s_2. Then the total quantity of heat that is contained in this body is equal to the following expression: $M_2 \times t_2 \times s_2$.

If the first body is assumed to be a mass of metal and the second body a large mass of water, large in comparison with the mass of the metal, and if the water is at a lower temperature than the metal, then when the heated metal is plunged into the mass of water, the temperature of the latter will be increased, due to the transfer of the heat in the metal to the water, and the temperature of the metal will be decreased. The flow of heat from the hot to the cold body will continue, as has been explained in previous lessons, until they attain a common temperature. If in this process it is also assumed that there is no loss of heat, and that all of the heat contained in the metal, that can be transferred, is eventually absorbed by the water, then the final quantity of heat contained in the system is the sum of the original amount of heat in the water and the additionaal heat contained in the metal.

The State of Equilibrium

When it is assumed that the final temperature of the mixture is designated by the factor t, the hot body cools down to this temperature, while the cold body is heated up to that temperature. Then the heat in the cold body at the temperature t is equal to the following expression: $M_1 \times s_1 \times (t - t_1)$. For the heat that is added to any substance is equal to the mass of the substance multiplied by its specific heat and also by the temperature rise.

By analogy the heat that is lost by the warm body, which cools down to the temperature t, may be found from the following expression: $M_2 \times s_2 \times (t_2 - t)$.

Now the original assumption was that the heat gained by the cold body was exactly equal to the heat that is lost by the hot body. Therefore, the following equation can be written:

$$M_1 \times s_1 \times (t - t_1) = M_2 \times s_2 \times (t_2 - t).$$

This is the fundamental equation on which the method of mixtures is based. It is also the equation that can be used in industrial calculations to determine the amount of heat that is transferred or the quality that is required to bring about a certain rise in temperature, when the heated body and the one whose temperature is to be raised come in contact with one another. This equation is, of course, applicable only under certain conditions, and must be modified in order to take care of the loss of heat by radiation, conduction, etc.

Further Modification of Equation

The specific heat of water, designated by s_1, is known. It is unity, the standard to which all specific heats are referred. Hence it is necessary to solve the equation for the specific heat, s_2. The result is as follows:

$$s_2 = \frac{M_1 \times 1 \times (t - t_1)}{M_2 \times (t_2 - t).}$$

The specific heat determination is carried out in an apparatus which is known as a calorimeter. This is nothing but a cylindrical vessel which is well insulated and provided with an accurate thermometer and a stirrer. When the hot body is dropped into the water in the calorimeter, not only the temperature of the water, but that of the entire apparatus is raised. In other words, the heat contained in the hot body is conducted into the substance of the ap-

paratus, and hence the temperature of the water does not rise to the point that it would, if all the heat could be isolated in it. This simply means that more heat is absorbed from the hot body than is contained in the body of water when the temperature reaches a stationary point, that is, does not rise any further. In order to take this into consideration and obtain accurate results, a test is made to determine what amount of heat is absorbed by the substance of the calorimeter, and this is expressed in terms of an equivalent weight of water, which has the same effect as far as the heat transfer is concerned.

Public Relations*

Its significance to the public and to the gas industry

B. J. Mullaney

Vice-President, Peoples Gas Light & Coke Company, Chicago, Ill.

WE say it a lot and say a lot about it. But do we say—or think—enough about what it means?

Take a parallel. In social affairs, "domestic relations" includes such varied details as the breakfast table grouch, objections to bobbed hair, drunkenness, wife-beating and division of the family budget. So, in our business, "public relations" connotes an even greater variety of details, ranging from the manners of meter readers, counter clerks and telephone girls up to questions of rates, of regulation, of service, of financing and other problems of management. Anything that has to do, directly or indirectly, with contacts between the public and the company is an item in "public relations."

A Matter of Prime Importance

This phase of our business thus becomes of first importance beyond any other. For see what happens when our public relations are bad, when our customers (the public) dislike us. Our service and product are bought reluctantly, or not at all if substitutes can be had, and our business stagnates or declines; getting fair rates from official bodies, political in character and sensitively responsive to public opinion, is made harder; unfair or inadequate rates make financing more difficult; and so the effects of bad public relations run steadily toward disaster.

Establishing Good Public Relations

Good public relations are established by doing two things: (1) by making our respective companies and their service worthy of being well thought of; and (2) by telling our customers (the public) all about our respective companies and service in detail—every detail that can possibly concern or interest them. Doing the first will not take you far if the second is not done, and persistently done, as often and as much as circumstances will permit.

You may think good service should speak for itself. It should, but it doesn't—not in this age of airplanes, movies and radio, with so much besides our service clamoring for attention. As Kin Hubbard's "Abe Martin" has said: "The prettiest girl in town is apt to die an old maid unless she gets out and advertises some."

On the other hand, silence is easily mistaken for secrecy; secrecy breeds suspicion; and suspicion, if not checked, soon ripens into hostility. This public relations may become bad, even when the service is good; it has happened.

Beware the Publicity Specialist

Beware the "publicity specialist," when you get this far in public relations work. Shun all that savors of press-agenting, propaganda, or seeking free space puffery instead of honestly paid-for advertising. That sort of thing serves no purpose in our business except to get "easy money" for the "publicity specialist." But make all the use you can of the other kind of publicity which frankly recognizes: (1) that a clam-like attitude is oftener evidence of stupidity than of wisdom; (2) that a policy of secrecy implies the existence of much that one doesn't dare tell; (3) that favorable public opinion is a better revenue-producer than monopoly; and (4) that elimination of silence and secrecy is the first step toward letting public opinion become favorable.

There is no other way of clearing up common errors and misconceptions. The public does not yet, for example, entirely realize how our business and all public utility business is utterly unlike other businesses in certain fundamentals. To illustrate:

Gas, the Immediate Servant

When the customer wants gas (to cook supper or start the factory) she or he expects to turn a valve and get it—not later or some time, but that instant.

(Continued on page 106)

*Outline of address delivered at Mid-Winter Conference of American Gas Association, San Francisco, California, January 30, 1925.

Catechism of Central Station Gas Engineering in the United States

Installment No. 56.

(Continued from last week)

Fourteen oz., or ⅞ of a lb. of carbon, will develop, in burning, ⅞ of 14,647, or 12,817 heat units. One pound of hydrogen, burning to water vapor, develops 52,038 heat units and 0.5 ounce or 1-32 of a pound will therefore develop, in burning, 1-32 of 52,038, or 1,626 heat units. The total heating power developed by the combustion of this coal will therefore be 1,626 + 12,817, or 14,443 heat units. The actual amount of heating power developed would be somewhat less, because a certain amount of the heating power of the hydrogen and carbon would be consumed in breaking up the chemical combination in which the hydrogen and carbon exist in coal before these elements could combine with oxygen to form carbon dioxide and water vapor.

Spontaneous Combustion

292. What is spontaneous combustion and in what part of a coal gas works is it most apt to occur?

Ans. Spontaneous combustion is combustion which is caused not, as is ordinarily the case, by the exposure of combustible matter to an outside source of heat of intensity and capacity sufficient to heat the combustible to the temperature of ignition, but by a rise in temperature produced by reactions taking place either between two or more of the different substances of which the combustible matter is composed or between these substances and the oxygen of the surrounding air. In other words, it is combustion which is brought about without the application of fire, or of intense heat from an outside source.

Spontaneous combustion can only take place under conditions which permit of the comparatively rapid oxidation of one or more of the components of a combustible substance, and at the same time confine the heat produced by this oxidation to such an extent that it will produce local heating up to the temperature of ignition.

In gas works spontaneous combustion is most apt to take place in the interior of the piles of gas coal stored for future use, but it may also occur as the result of the accumulation of oily waste or rags in a confined space.

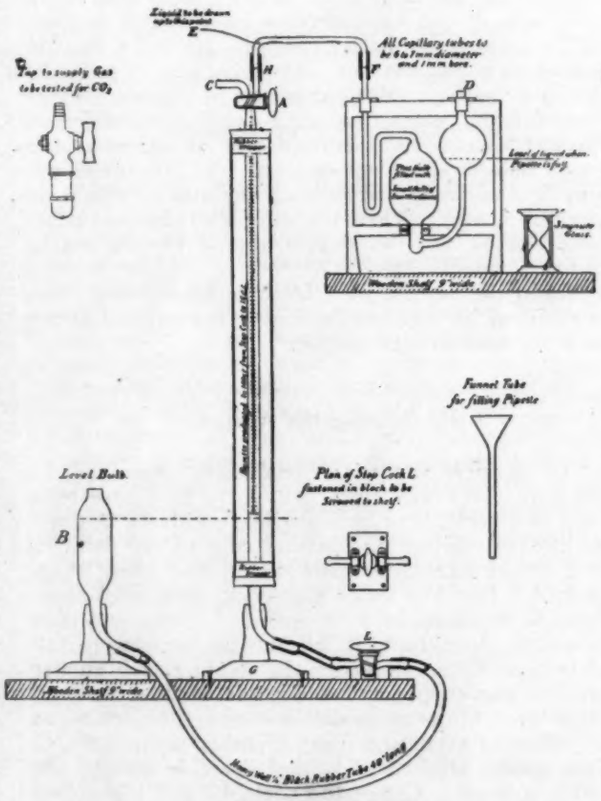
Quantitative Tests for CO_2 and H_2S

293. How would you make quantitative tests for carbon dioxide and sulphuretted hydrogen in gas? How much by volume of each would you expect to find in coal gas and in carburetted water gas at the inlet to the purifiers?

Ans. "A rapid estimation of the carbon dioxide in gas can be made as follows:

"The apparatus employed is shown in the cut. It consists of a water jacketed graduated burette provided at its lower end with a levelling bulb and communicating at its upper end with the gas supply and the absorption bulb by means of a three-way stop-cock.

"It has a capacity of about 105 c. c. and is graduated in one-fifth c. c. from the stop-cock down to



Apparatus for Rapid Determination of Carbon Dioxide in Gas

the 100 c. c. mark. The burette is mounted on a solid iron base, which is screwed down to a shelf provided for the purpose close to the gas supply.

"The CO_2 is absorbed by a solution of caustic potash in a pipette filled with rolls of iron wire gauze, which presents a large surface to the gas. The iron stand holding the pipette is placed on a shelf at a proper height and is connected to the burette by means of a capillary tube with rubber connections. Before making a test, the gas must be

freed from sulphuretted hydrogen by passing through an oxide purifier.

"To set up apparatus: Set lower shelf about 36 inches from floor. Screw base of burette, G, firmly to shelf, placing it about half way between wall and edge of shelf. Set upper shelf at such height that the top of capillary, F, on pipette will be level with top of capillary, H, on burette. Fill pipette with potash solution as directed below, and connect parts of apparatus with rubber tubing as shown in drawing. Screw frame of pipette to the upper shelf.

"Loosen upper rubber stopper of water packet and fill with clear water. Use distilled water if possible, as it will remain clear and free from annoying air bubbles.

"Saturate some clear water, preferably distilled, by allowing gas to bubble through, and with it fill level bulb, B, letting water run into burette as well.

"To prepare solution: Dissolve ¼ lb. of caustic potash in a half pint of water, distilled if possible.

"To fill pipette: With capillary of pipette disconnected from connection at F, pour the solution through funnel tube into pipette at D, until the round bulb is about one-quarter full. Then connect pipette and draw the solution up into capillary as directed below. When the cylindrical bulb is completely filled, the round bulb should remain nearly empty.

"Refill the pipette with fresh solution about once in six months, and carefully note the date of filling on a tag attached to pipette.

Performing the Analysis

"To perform analysis: Open lower stop-cock, L, and turn three-way stop-cock, A, so that burette is open to pipette, then by lowering level bulb, B, draw the potash solution up capillary tube to the point E, just before capillary turns down, and close stop-cock, A. Leaving lower stop-cock open, turn stop-cock, A, till capillary, C, is open to burette, and then by raising level bulb, B, fill burette completely full of water. Close stop-cock, L. Now attach rubber tube to gas supply and allow gas to flow through tube for a moment to displace air; then with gas still flowing attach free end of tube to capillary, C. Open lower stop-cock, L, and draw in gas to the 100 c. c. mark. Close stop-cock, L, and then close stop-cock, A, and detach rubber tube. After three minutes bring the level of the liquid in burette exactly to 100 c. c. mark by raising or lowering level bulb, and close lower stop-cock, L. Open stop-cock, A, to capillary, C, for a moment in order to allow surplus gas to escape. There will now be exactly 100 c. c. of gas in burette, measured under atmospheric pressure. Now open stop-cock, A, to pipette and force gas over into pipette by raising level bulb; draw gas back into burette immediately, letting the potash solution follow up capillary to point E as before, and close stop-cock, A. After three minutes, by raising or lowering level bulb, B, bring the water into burette and level bulb to the same level and close stop-cock, A. After three minutes, by raising or lowering level bulb, B, bring the water in burette and level bulb to the same level and close stop-cock, L. Note the point at which the water now stands in burette, and the difference between this reading and the original amount taken will be the CO_2 absorbed.

"Note.—See that the stop-cocks are kept well greased. If a stop-cock is found to be stuck, do not apply force to turn it. It may readily be loosened by warming the glass with a cloth dipped in hot water. When apparatus is not in use, the open ends of level bulb and pipette should be closed with corks. —(Adapted from Hempel's Gas Analysis.)

Portable Apparatus for H_2S Determination

The amount of sulphuretted hydrogen in illuminating gas can be determined with a portable apparatus for the purpose devised by Mr. C. C. Tutwiler. "To describe the apparatus briefly, it consists of an absorption burette, provided with 3-way glass stop-cocks above and below, the upper one having a connection for the intake of gas and also connecting with a measuring tube surmounting it. This measuring tube is divided into c. c., which are again divided into tenths, holding together 10 c. c. of the iodine solution. This solution is carefully prepared so that each c. c. contains 0.0017076 grammes of iodine, which is calculated to absorb 100 grains of H_2S per 100 cubic feet of gas. In the lower part of the burette is admitted about 5 c. c. of a starch solution made by dissolving one gramme of pure starch in 150 c. c. of water. After the burette has been filled in the usual manner with 100 c. c. of the gas to be tested, the iodine is trickled in, drop by drop, with frequent shaking of the burette. As long as H_2S is present, the iodine is neutralized by it and does not affect the starch water, but as soon as all the H_2S present in the gas has been neutralized, any excess of the iodine will turn the formerly clear white starch water blue, and the operation is then stopped. Readings of the scale on the measuring tube taken before and after the operation give the amount of iodine used to take out the H_2S, and a simple calculation will then give the number of grains of this impurity. If, for instance, we consumed 4.6 c. c. of the solution, we find that we had 4.6×100, or 460 grains of H_2S in 100 cubic feet. The possible error with careful manipulation is said not to exceed 10 grains."

The percentages of carbon dioxide and sulphuretted hydrogen found in coal gas at the inlet to the purifiers will vary with the efficiency of the washing and scrubbing apparatus through which the gas passes before reaching this point, since the ammonia in the gas can, by proper treatment, be made to combine with a large proportion of these impurities and remove them from the gas before it enters the purifiers. The percentage of sulphuretted hydrogen will also vary with the percentage of sulphur in the coal from which the gas is made.

(Fifty-seventh Installment Next Week)

FINANCING PUBLIC UTILITIES

(Continued from page 92).

bonds may be issued to an unlimited amount in different series upon such terms and provisions as to date of maturity, interest rate, etc., as may be determined at the time of the authorization of each series, the mortgage providing that bonds of other series may be issued par for par to pay off outstanding bonds and that additional bonds may be issued up to a given percentage (70 to 85, generally 75) of the cost or value of additional property subsequently acquired, provided the net earnings applicable to the payment of interest exceed the interest charges by a certain amount (1¾ or twice).

The Sinking Fund

It is interesting to note that the older mortgages commonly provided for a sinking fund sufficient to retire all or a proportion of the bonds prior to maturity but that due to the realization of the permanence of the funded debts of utilities and the necessity of ultimately capitalizing such sinking fund payments, that is, issuing securities to reimburse the company therefor, the tendency is away from sinking funds and in favor of requirements as to maintenance of the property. In other words, in place of reducing the debt on the theory that the security behind it is depreciating in value, it is provided that the property shall be maintained at 100 per cent operating efficiency. This is also due to a growing appreciation of the fact that one of the most substantial elements of value in public utility properties is the commercial success of the enterprise, and that, independent of a successful enterprise, there is little or no market in which the property secured by mortgage can be sold in case of failure to pay the debt or interest on the bonds, the cost of removing the facilites of certain type of utilities, more especially street railways and gas companies, exceeding their salvage value. Earning capacity rather than physical value constitutes the security. It is, however, often considered desirable to provide for a small semi-annual sinking fund for the purpose of maintaining a market for the bonds, the sinking fund moneys being applied to the purchase of bonds at or below the redemption price.

Unsecured Bonds, Notes and Debentures

In addition to bonds secured by mortgage, capital may be raised through the sale of other evidences of indebtedness such as unsecured bonds, notes or debentures. Such evidences of indebtedness like mortgage bonds are part of a company's funded debt and carry definite provisions as to payment of principal and interest, but upon default a holder has no prior claim on the property of the company, but can only share with the other general creditors. For this reason the security is not as great as a mortgage bond, although a company having a strong credit position can often borrow money just as cheaply through such securities.

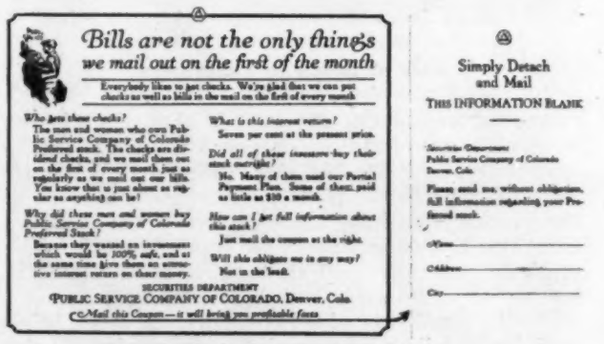
Preferred Stock

To go back for a moment, we have seen that initially capital was raised by means of stock representing the contribution of the proprietors; that later the tendency was to relv upon borrowed money represented by bonds secured by mortgage or by other unsecured evidences of indebtedness. This step was marked by the introduction of preferred stock which, as the name implies, is a stock having preference over other stock, the main preference being as to dividends and assets, that is to say, dividends must be paid on the preferred stock before any dividends are paid on the common stock and in case of dissolution of the company its assets are applied to the payment of the holders of the preferred stock before any distribution is made to the holders of the common stock. There may be any number of classes of preferred stock with varying degrees of preference.

Reasons for Preferred Stocks

Among the causes for the introduction of preferred stocks may be mentioned the following:

The necessity (as just mentioned) of preserving the relationship between the amount of bonds and the amount of stock outstanding, both from the standpoint of conservative financing, and the requirements of the bankers purchasing issues of bonds, it being essential in order to sell any bond issue that there should be an amount of actual money invested by the stockholders, that is, the owners of the enterprise, sufficient to afford a guarantee that in their judgment the business is likely to prove successful. In bankers' parlance, there must be sufficient equity behind the bonds. In addition, there are in most states statutory provisions regulating the relation between the amount of stock and the amount of bonds and the proportion is now also


Bills are not the only things we mail out on the first of the month
Everybody likes to get checks. We're glad that we can put checks as well as bills in the mail on the first of every month
Who gets these checks?
The men and women who own Public Service Company of Colorado Preferred stock. The checks are dividend checks, and we mail them out on the first of every month just as regularly as we mail out our bills. You know that is just about as regular as anything can be!
What is this interest return?
Seven per cent at the present price.
Did all of these investors buy their stock outright?
No. Many of them used our Partial Payment Plan. Some of them paid as little as $10 a month.
Why did these men and women buy Public Service Company of Colorado Preferred Stock?
Because they wanted an investment which would be 100% safe, and at the same time give them an attractive interest return on their money.
How can I get full information about this stock?
Just mail the coupon at the right.
Will this obligate me in any way?
Not in the least.
SECURITIES DEPARTMENT
PUBLIC SERVICE COMPANY OF COLORADO, Denver, Colo.
Mail this Coupon—it will bring you profitable facts
Simply Detach and Mail
THIS INFORMATION BLANK
Securities Department
Public Service Company of Colorado
Denver, Colo.
Please send me, without obligation, full information regarding your Preferred stock.
Name
Address
City

AFTER MONEY AND GETTING IT

How the Public Service of Col. Interests Its Customers in Its Securities

largely influenced by public regulation of capitalization through Public Service Commissions. While we find limits as to the proportion of bonds to stock, broad limits in the statutes and often narrower limits in the requirements of the bankers, it cannot be said that in any given case the proportion should be a definite percentage, although it is always well to have limits in mind beyond which, as a general proposition, it is not desirable to go. So we may fix rough limits of 66 2-3 per cent of bonds and 33 1-3 per cent of stock to vice versa, 33 1-3 per cent of bonds and 66 2-3 per cent of stock. Somewhere within these limits will be found the desirable proportion in any given case.

Determining Amount of Bond and Stock Issues

An important consideration in determining the amount of bonds and stock to be issued is that, due to the greater security, money obtained through the sale of bonds is cheaper than money obtained through the sale of stock, the differential being anywhere from 1 to 2 per cent per annum. As a public utility has a relatively large amount of capital invested in its business in proportion to the income it produces, its capital is turned over relatively slowly, once in three to five years, whereas, an industrial may turn over its capital as rapidly as several times a year. This means that an additional cost of 2 per cent (2 cents) per annum for each dollar of capital will cost a utility on the average of 8 cents additional; for instance, assuming the company sells its securities at par, money raised through the sale of a 5 per cent bond costs the company in carrying charges 20 cents for each dollar obtained (5 cents a year for four years), whereas, money raised through the sale of 7 per cent preferred stock would cost in carrying charges 28 cents for each dollar obtained (7 cents a year for four years). You will see that is an item that must be reckoned with.

Summing up the proportion of bonds to stock it might be said that the ideal relationship is that which allows the corporation to apportion its earnings so that it is possible to maintain the highest degree of credit and at the same time pay adequate dividends to its stockholders and retain a working surplus.

Sale of Stock to Customers

Another reason for the introduction of preferred stocks was the desire to sell stock to customers, so that they might become more interested in the affairs of their local utilities, the original owners of the property retaining their control of the management through ownership of the common stock. The stock is generally sold through what is popularly known as customer-ownership campaigns, carried on by the employees of the company, the stock being paid for in full or on a partial payment plan usually running over a period of 12 to 14 months. In some cases the sales are carried on continuously as one of the ordinary activities of the company and in others are concentrated into periodic campaigns.

Customer-ownership has the added value of educating the employees in the affairs of the company with which they must be familiar before talking intelligently to prospective customer-purchasers of stock. It is also a means whereby the employees themselves become part owners of the company and, in addition, is less expensive, the selling costs being perhaps one-half the cost of selling the stock through bankers.

Another Advantage of Preferred Stock

Still another explanation of the adoption of preferred stock is the possibility of selling stock through customer-ownership campaigns in smaller aggregate amounts than bonds or stock sold through bankers, in order that the ordinary capital expenditures from year to year may be taken care of without the necessity of borrowing large sums from the banks until such time as a sufficient amount of capital expenditures has been made to justify an issue by the bankers. Only in rare cases have companies attempted to sell bonds through customer-ownership campaigns.

Most modern preferred stock issues contain many provisions similar to those of open-end mortgages, providing for additional issues of stock at varying dividend rates and other elastic provisions as to redemption, etc., in order that the company may take advantage of the financial conditions existing at the time of each issue. (Let me say here, that no bonds or preferred stocks should ever be issued without a redemption provision. The absence of such privilege may prove very costly to the company or absolutely prevent a desirable financial reorganization.)

Modern Preferred Stock More Like a Bond

The modern preferred stocks are, in fact, becoming more in the nature of a bond, with these main differences, however—the owners' investment is not secured by lien on the property or claim against the company, as in the case of a bondholder; there is no fixed date on which the preferred stock is to be paid off, and the return to the investor is only paid if earned by the company. For these reasons the fixed rate of return is usually higher on preferred stocks than on bonds. Formerly, many preferred stocks were non-cumulative (that is, dividends not earned in any year were not necessarily paid subsequently) and were participating (that is, received a fixed dividend and shared in additional dividends after the payment of a given amount on the common stock and on liquidation shared ratably with the common stock or equally in any balance of assets after the payment of the par value of the preferred and common shares). Modern preferred stocks are cumulative (that is, dividends not paid in any year must be paid subsequently before any dividends can be paid on the common stock) and are non-participating (that is, they bear a specified rate of dividend and no more, and on dissolution are entitled only to the payment of the par value and un-

paid dividends). In addition, preferred stockholders under the modern practice have no voting rights, except in certain cases, such as failure to pay dividends for a specified period and when required by statute.

Summary

Summing up, it may be said that generally a public utility whose credit is satisfactory, periodically issues stocks, bonds or other evidences of indebtedness for expenditures made or to be made for the acquisition of additional property, extension or improvement of its plants, system and service and the refunding of its obligations and pending such issuance temporarily finances such requirements from earnings and through loans from banks.

In closing, let me impress upon you that there is no greater responsibility in business than that of using other people's money. While your first duty is to safeguard the interests of your corporation, in doing so do not be blind to the just requirements of the investor. You will not be long engaged in the financing of utilities before you will appreciate the difficulties to be faced in reconciling these two interests and at the same time complying with statutes which are, as a rule, more restrictive than permissive.

GAS EXPLOSIONS

(Continued from page 90)

ing alcohol, its content being ignited by the flame of the first. However, there were other inflammable materials in the basement which might have caused it after a flame had once started.

Later developments, however, indicated that it was not unreasonable to suspect arson, as it became known that two men, one of them badly burnt about the hands and face, had called on a doctor some distance from the scene of the fire. This was about 2 o'clock on the same night. The doctor advised them to go to a hospital, but no hospital admitted such persons during that night or on the following morning. Later they were traced to Atlanta, but lost sight of before they could be apprehended.

I have related these cases to show how easily illuminating gas can be made the goat for accidents if not properly investigated.

OIL CONSERVATION AND THE GAS INDUSTRY

(Continued from page 91)

cessantly to conserve the sources of the nation's heat. Its whole plan and scope of operation is based on the most efficient extraction of heat from its sources and its most economical distribution and application."

Mr. Abell said that Federal action along conservation lines was a natural development, in view of the fact that fluctuations in the price of oil, periodic coal shortages, and the inevitable, though gradual, dwindling of the nation's fuel resources, are compelling industry more and more to rely on gas service.

Dependence of Industry on Gas

"More manufacturers turned to this process of heating last year than had done so in all time previous," he said. "The dependence of industry upon an uninterrupted gas service is so great that if anything were to happen to gas service over night nearly 300,000 American mechanics would have to adjust themselves to idleness or new occupations in the morning."

Stating that the executives of gas companies would lend the Government every co-operation in its plan of conservation, Mr. Abell said:

"We have got to make plans for an industry three times its present size. If gas service does not replace industrial use of oil this year, the change will be made next year or the year after. It is inevitable. To be able to take on this business, we must obtain hundreds of millions of dollars of new capital; we must make gas quicker, and make it in larger quantities; we must have the full co-operation of the regulatory bodies and we must adjust rates so that the cost of service will be equitably proportioned among all classes of customers."

TEMPERING SPRINGS IN A CONTINUOUS OVEN

The resiliency in an automobile seat is obtained by its coil spring construction. Series of helical coil springs similar to those used in bed spring construction are formed on helical forming machines in great quantities. The wire used in these helical coils after having been formed is too hard to be used in a seat and to give service, without the coils flattening, and it becomes necessary to temper them.

Immediately after being formed the coils are packed into perforated metal trays, each tray holding 50 lbs. of wire coils, and carried in a continuous procession on gravity conveyors to the tempering oven to which they are transferred.

The Tempering Oven

The oven temperature is maintained at 500 degrees F. Direct gas burners with blast tips, operating at one pound pressure developed by a Roots gas pump are controlled automatically by Robertshaw temperature controllers.

With both conveyors operating, the oven equipment accommodates 240 trays per hour, each holding 40 lbs. of coils, making a total of 9,600 lbs. per hour delivered, or approximately 86,400 lbs. per nine-hour day. The heat treating time is 15 minutes. The springs have a blue color as they emerge from the oven.

PUBLIC RELATIONS

(Continued from page 100)

Many others may be turning on the gas at the same time—all (several hundred thousands in New York and Chicago) starting to get supper at the same time—but that makes no difference; each wants what she wants when she wants it—at that moment —and gets it. This instant response is expected from nobody else—butcher, baker or candlestick maker. They take their time in serving; the gas and other utility companies do not and cannot.

The merchant or manufacturer can suspend partially or entirely, when business slackens or any condition cuts off profit. The gas or other utility has to run the year around at normal capacity, even at a loss.

The merchant or manufacturer may do from $3,000,000 to $10,000,000 of business a year, and even more, on a capital of $1,000,000, turning their capital three to ten or more times a year; the utility company, on the average, turns its capital only once in five years and can do only about $200,000 of business a year on an investment of $1,000,000.

Saginaw News-Courier
10-6-24
"GOOD GAS SERVICE"
AN INVITATION
—TO THE—
Housewives of Saginaw
You are invited to see the rest of your kitchen—the Gas Plant—where is made the Good Gas Service that cooks the Breakfast, Dinner and Supper for so many thousands of our homes here.
Come and see the many interesting things in the making of Gas—the "cooking" of coal—the making of coke—the scrubbing of GAS—and how it is stored, pumped and measured to you—miles away.
You are interested in household expenses—see what goes into the cost of Gas and how it has been made one of your cheapest necessities.
Come with your friends. Guides are here to escort you about and explain the many truly wonderful operations. You will enjoy it.
Come any afternoon from 2 p. m. to 4 p. m.
A special bus will leave our office every afternoon this week at 2:30 p. m. You are invited to go in this bus to our gas plant at Zilwaukee. Bus will be back in Saginaw at 4 p. m. Those who wish to drive their own cars will find good roads right to the gas plant north of Zilwaukee.
"Come as Our Guests"
Consumers Power Company

Enlisting the Interest of the Gas Customer, as Part of a Recent Home Week Campaign for Utilities

The Rate Problem

On rates, the customer is apt to think we want them as high as possible. He does not reason, until we point it out, although it is as logical as the multiplication table, that our interest lies in having rates as low as possible, so that use of our product may be stimulated and mass production fostered.

But don't overlook the employees as a factor in public relations. They are the chief points of contact between the company and the customers; to most of our customers they are "the company." By what employees say and do in these contacts the company is interpreted. Obviously, the interpretation will be most advantageous to the company if the employees, in addition to being enthusiastically loyal, are also well informed on the company and its business and its policies in all detail.

The social significance of public relations—value to the community at large—is also to be noted.

Public Relations Work Really Service to Community

Good relations between an informed public and a gas company tends to eliminate rate or other controversies and to stabilize fair rates. Adequate rates simplify financing. Easier financing tends to reduce the fixed-charge ratio, and, at the same time, to encourage extensions and improvements in service facilities. This, in turn, tends toward better service at lower rates and greater use of the service —and so on around the circle again to still better service and lower rates. Hence public relations work in a public utility company is, in the fullest sense of the word, an additional service to the community and to the people that are served by the company.

MANUFACTURED GAS IN 1923 CENSUS

(Continued from page 98)

Table 2—Detailed Statistics of Products and Principal Materials, 1923 and 1921

		1923	1921	increase (a) Per cent of
Total value of products		$450,096,822	$411,195,503	9.5
Gas, total (for sale)	M. cu. ft	356,471,919	306,058,339	16.5
	value	$394,507,469	$372,032,009	6.0
	av. unit value	$1.11	$1.22	...
Mixed coal and water gas	M. cu. ft.	208,160,340	169,847,196	22.6
	value	$220,961,192	$196,104,367	12.7
	av. unit value	$1.06	$1.15	...
Carbureted water gas	M. cu. ft	117,448,146	110,053,263	6.7
	value	$134,647,314	$138,512,868	-2.8
	av. unit value	$1.15	$1.26	...
Oil gas	M. cu. ft	19,741,428	17,656,116	11.8
	value	$22,989,480	$23,611,975	-2.6
	av. unit value	$1.16	$1.34	...
Coal gas	M. cu. ft	7,412,438	7,329,382	1.1
	value	$13,059,870	$12,518,687	4.3
	av. unit value	$1.76	$1.71	...
Other mixed gas	M. cu. ft.	2,996,020	1,000,287	199.5
	value	$2,456,392	$1,200,156	104.7
Other	M. cu. ft	713,547	172,095	312.6
	value	$393,221	$83,956	368.3
Coke, total production	short tons	3,725,198	3,895,052	4.4
For sale	short tons	2,194,983	2,031,239	8.1
	value	$21,532,541	$17,503,289	23.0
Made and consumed	av. unit value	$9.81	$8.62	...
	short tons	1,530,215	1,863,813	-17.9
Breeze, total production	short tons	397,865	(b)	...
For sale	short tons	88,752	(b)	...
	value	$343,404	(b)	...
Made and consumed	short tons	$309,113	(b)	...
Tar (for sale):				
Coal-gas	gallons	58,876,615	60,333,000	-2.4
	value	$3,038,983	$3,203,620	-5.1
Water-gas	gallons	49,750,173	52,923,588	-6.0
	value	$1,986,769	$2,170,653	-8.5
Oil-gas	gallons	240,667	509,357	-52.7
	value	$14,594	$21,362	-31.7
Ammonia products, NH_3 equiv	pounds	22,749,956	(b)	...
	value	$1,924,240	$1,667,851	15.4
Crude light oil (for sale)	gallons	1,373,964	1,565,769	-12.3
	value	$110,393	$111,641	-1.1
Light oil derivatives	gallons	1,035,976	2,015,512	-48.6
	value	$234,233	$354,012	-33.8
Drip and holder oil	gallons	3,924,318	2,950,214	33.0
	value	$269,018	$180,118	49.4
Naphthalene (for sale)	pounds	1,452,463	795,282	82.6
	value	$45,981	$33,248	38.3
All other products (c)	value	$2,451,968	$1,335,602	83.5
Receipts from lamps and appliances	rents	$2,602,659	$2,833,059	-8.1
	sales	$21,034,570	$9,749,039	115.8
Principal materials consumed—				
Coal for gas making—				
Anthracite	long tons	1,136,937	1,129,601	0.7
Bituminous	short tons	6,245,975	5,706,825	9.4
Coke for gas making—				
Purchased	short tons	1,732,276	1,543,289	12.2
Made and consumed	short tons	815,003	755,416	7.9
Oil for gas making and enriching	gallons	874,234,328	841,771,142	3.9

(a) A minus sign (-) denotes decrease.
(b) Not reported.
(c) Includes pitch, gas-house lampblack, retort carbon, spent oxide, etc.

Current Market Prices

COALS (By Courtesy of Coal Age)
A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.40 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.40
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	2.25 to 2.75
Kanawha mine run	Columbus	1.50 to 1.70
West Virginia lump	Cincinnati	1.85 to 2.50
W. Virginia gas mine run	Cincinnati	1.25 to 1.40
Midwest		
Indiana 4th vein lump	Chicago	3.00 to 3.25
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.50 to 3.25
Big Seam mine run	Birmingham	1.50 to 2.00
Southeast Kentucky lump	Louisville	2.50 to 3.00
Southeast Kentucky mine run	Louisville	1.25 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons).

Market	Freight rates	Independent	Company
Egg New York	$2.24	$8.50 to $8.75	$8.75 to $9.25
Egg Philadelphia	2.39	9.45 to 9.75	8.80 to 9.25
Egg Chicago (net tons)	5.06	8.17 to 8.40	8.08

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$3.85 to $5.50
Wise County, furnace	4.25 to 4.50
Alabama, furnace	4.00 to 4.50
Foundry, Newark, N. J., del.	10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill.	9.00
Foundry, Alabama	4.56 to 5.00

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.45
Corning, Ohio	1.50
Lima	1.68
Pennsylvania	$3.25 to 3.35
Wooster, Ohio	1.50
Indiana—Illinois.	
Illinois	1.47
Indiana	1.48
Oklahoma—Kansas.	
Mid-continent (low gravity)	1.00
Gulf Coast.	
Gulf Coast, Grade A	$1.50
Gulf Coast, Grade B	1.25

GAS OILS.

Gas Oil, Bayonne, bulk gal.	5¼c
Gas Oil (32-36) Oklahoma, gal.	3½ to 3¾c
Gas Oil (32-36) Gulf Coast, gal.	3¾ to 4 c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$58.20 to $59.20
Six-inch and over, Chicago	54.20 to 55.20
Four-inch, Birmingham	49.00 to 49.50
Six-inch and over, Birmingham	45.00 to 45.50
Four-inch, New York	65.50 to 66.50
Six-inch and over, New York	60.50 to 61.50
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch plus $20.
4-inch, plus $20; 3-inch, plus $20

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb.	5 to 5¼c
Ammonia aqua, 20 deg. drums lb.	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb.	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb.	30 to 36 c
Ammonium sulphate, bulk F. O B. Works, per 100 lbs.	$2.75 to $2.80
Potash prussiate, yellow casks,	19 to 19½c
Potash prussiate, red casks, lb	38 to 39c
Soda prussiate, yellow casks,	10¾ to 11c
Soda sulphocyanide, barrels, lb.	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

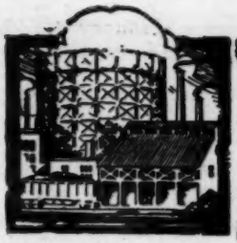
Benzol C. P. tanks, works, gal.	25c
Benzol, drums, gal.	30c
Benzol, 90% tanks, works, gal.	23c
Benzol, 90% drums, gal.	28c
Napthalene, flake, barrels, lb.	5½ to 6 c
Napthalene, dyestuff bags, lb.	5 to 5½c
Solvent Naphtha, water white works, gal.	25c
Solvent Naphtha, drums, works, gal.	30c
Toluene, C. P. tanks, works, gal.	26c
Toluene C. P. drums, works, gal.	31c

Coal

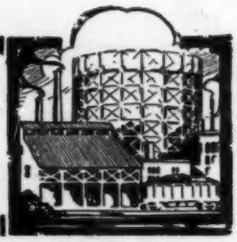
Production of bituminous coal during the week ended January 17, according to the Geological Survey, receded markedly from the high level of the previous week. The total output is estimated at 12,077,000 net tons, a decrease of 513,000 tons from that of the week ended January 10, when 12,590,000 net tons was produced, according to revised figures. Anthracite output during the week ended January 17 was 1,803,000 net tons, compared with 1,785,000 tons in the previous week and 1,884,000 tons in the corresponding week a year ago.

Gas Oil

The market was featured by an upward movement in gas oil locally. Gas oil 28 degrees or better, was quoted ½c per gallon higher at 5¼c per gallon in bulk, f.o.b. Bayonne refinery.



NEWS OF THE GAS INDUSTRY



Program of Southern Section Meeting of Pacific Coast Gas Association Feb. 2, 1925

(Morning)

Meeting of board of directors.

Committee meeting.

(Afternoon)

General session—President E. L. Hall, chairman.

All members of the Pacific Coast Gas Association and their friends are invited to attend this meeting. The officers and members of the Advisory Council of the American Gas Association will be present and take part in the discussions.

Address—President E. L. Hall.

The Control of Carbon Monoxide—Walter M. Berry.

Some Proposals for Advertising—Advertising Committee, Commercial Section.

Gold Medal Presentations.

Committee Progress Reports.

(Evening)

Get-Together Dinner, Hotel Alexandria ballroom.

President E. L. Hall presiding.

The dinner is open to all members and friends of the association and their wives. The officials of the American Gas Association will be the guests of our association at this dinner.

Address of Welcome to A. G. A.—Wm. Baurhyte, president of Los Angeles Gas & Electric Corporation.

The American Gas Association, Its Ideals and Accomplishments—H. C. Abell, president of American Gas Association.

Pertinent Talks by Prominent Men.

Music—Los Angeles Gas & Electric Corporation Band and Southern California Gas Company Orchestra.

Vocal soloist, Miss Mildred Colville.

Course for Metermen at Purdue

Purdue University, LaFayette, Indiana, announces a three-day conference for gas metermen, which is to be offered by the engineering extension department under the direction of the School of Chemical Engineering on February 23, 24 and 25.

This conference will be conducted along practical lines and is intended to be of value to all men working with gas meters.

Mr. G. A. Lane, superintendent of meters, of the Peoples Gas, Light & Coke Company, has been secured to take charge of the demonstrations and shop practice.

Contracts Awarded

Fred W. Freese of Chicago has recently taken the contract to rebuild the gas plant at Oelwein, Iowa; also has an option on the gas plant at Atlantic, Iowa, and at Storm Lake, Iowa. He has also just completed the dismantling of a 50,000 cubic foot gas holder at Perry, Iowa.

Proposed Change in New York Utility Law

Senator Hickey of Buffalo has introduced a bill (Intro. No. 204) adding new section 4-b Public Service Commission Law, providing Public Service Commission shall have no power to fix rates for service charged by any public service company operating under municipal franchise if such rates were imposed as conditions of franchise or established by agreement. Referred to public service committee.

George W. Bixler Honored

George W. Bixler, advertising and publicity director of the Public Service Company of Colorado, has been named president of the Colorado Advertising Club.

New Jersey Gas Men Meet

Well-Attended Mid-Year Meeting Listens to Important Papers

The mid-year meeting of the New Jersey Gas Association was held on Friday, January 23, 1925, in the assembly hall of the Public Service Electric & Gas Company in Jersey City, N. J. The meeting, which was largely attended by members of the association, was called to order by the president, Raymond W. Lee.

The gas men were welcomed by Judge Spear, general attorney of the Public Service Electric & Gas Company. He bade the New Jersey gas men welcome and in his short address stressed the fact that the gas industry was just at the beginning of real success and that the industrial phase of the gas industry is becoming of increasing importance. He also emphasized the splendid position now occupied in general by gas utility securities in the financial world, as compared

with the difficulties encountered in former years in financing gas companies.

Correspondence Course in Gas

Mr. Gordon King, representing the American Gas Association, told about the various activities of the association, describing the work and plans of the various sections. He mentioned the fact that a correspondence course is being established under the direction of Professor Morgan of Columbia University, New York City. This course is to be purely technical and will be concerned with the manufacture and distribution of gas.

After the business of electing new members and a few minutes' talk by Mr. Burdick, new secretary of the Commercial Section of the American Gas Association, the meeting listened to Mr. Howard M. Bennett's paper on "Selling More Gas in Home Laundries."

Gas in the Laundry and Basement

It was pointed out in this paper that comparatively little or no attention has generally been given to the use of gas in the laundry and basement of the average house, although the number of gas-consuming devices in the basement is thrice that in the kitchen. Particular attention was paid to the gas-heated clothes drier. It was indicated that the sale of the comparatively new cabinet type of drier encounters a certain amount of resistance, but it is necessary to overcome this. Various objections to this drier, to the practice of drying clothes in such a device instead of in sunlight, with its attendant so-thought bleaching action, were answered in the paper. It was shown that this belief is erroneous. The address was a very thorough and comprehensive study of this problem of gas appliance merchandising and it was emphasized that there is a great opportunity for the sale of gas-consuming apparatus used in the laundry that will result in a marked increase in the consumption of gas in the domestic field.

A very interesting discussion followed the reading of this paper.

Demand and Distribution

The next paper delivered at the morning meeting was read by F. A. Lydecker, assistant general superintendent of distribution, Public Service Electric and Gas Co. This paper contained a detailed description of the work done in increasing the trunk line capacity of the Public Service Electric and Gas Co., which included the laying of lines through mountainous sections in the state of New Jersey, and described the different difficult conditions which were overcome by the engineers in charge of the distribution work of the company.

After a rather lively discussion which followed the presentation of this paper, the meeting adjourned for luncheon, which was served in an adjoining room decorated to resemble a summer garden. The luncheon was served under the auspices of the Public Service Electric and Gas Co., under the direction of Miss Ada Bessie Swan, of that company, who is also chairman of the Home Service Committee of the American Gas Association.

Afternoon Meeting

The afternoon meeting was devoted to three papers, as follows: "The Economics of Merchandising," by Alfred P. Post, comptroller, American Gas Company; "Industrial Gas Era," by William M. Hepburn, vice-president Surface Combustion Co.; "Why Closer Cooperation Between Gas Company and Appliance Manufacturers Is Necessary," by Harry Schall, vice-president Standard Gas Equipment Company.

All these papers were followed in their regular order by very interesting discussions, in which a large number of members took part.

National Sales Plan

The final paper of the afternoon was a talk on the Sales Stimulation Committee of the American Gas Association in reference to a National Sales plan, this talk being followed by the chairman of the committee, Mr. Robert Canniff, of the Central Hudson Gas & Electric Co. Mr. Canniff in his talk explained the program of the committee, also the manner in which the various details of the plan are to be worked out. A national gas sales plan is of utmost importance to the gas industry of the country. It will give an opportunity to both manufacturers of gas appliances and to gas companies to work together to develop gas and to co-ordinate their plans so that the maximum results can be obtained from them. The idea of developing a catchy gas slogan for use with gas advertisements is also of particular importance, as in other fields, for example, in the paint field, which has proven wonderfully successful, and there is no reason why such satisfactory results should not be obtained as well in the gas industry.

Gas Men Who Attended California Meeting

H. C. Abell, New York, N. Y.
D. D. Barnum, Boston, Mass.
Wm. H. Barton, Portland, Ore.
Wm. Baurhyte, Los Angeles, Calif.
Henry Bostwick, San Francisco, Calif.
K. R. Boyes, New York, N. Y.
Van E. Britton, Oakland, Calif.
C. N. Chubb, Davenport, Iowa.
H. H. Clark, Chicago, Ill.
R. C. Cornish, Philadelphia, Pa.
H. M. Crawford, San Francisco, Calif.
C. P. Cutten, San Francisco, Calif.
J. E. Davies, Chicago, Ill.
A. B. Day, Los Angeles, Calif.
J. S. DeHart, Jr., Newark, N. J.
B. J. Denman, Davenport, Iowa.
C. H. Dickey, New York, N. Y.
H. L. Doherty, New York, N. Y.
L. R. Dutton, Jenkintown, Pa.
Halford Erickson, Chicago, Ill.

H. B. Flowers, New Orleans, La.
O. H. Fogg, New York, N. Y.
A. Forward, New York, N. Y.
Ray S. Fuller, San Francisco, Calif.
W. G. Gribbel, Philadelphia, Pa.
E. L. Hall, Portland, Ore.
Mr. and Mrs. J. P. Hanlon, Newark, N. J.
R. B. Harper, Chicago, Ill.
A. F. Hockenbeamer, San Francisco, Calif.
Clifford Johnstone, San Francisco, Calif.
L. M. Klauber, San Diego, Calif.
J. B. Klumpp, Philadelphia, Pa.
S. G. Krake, New York, N. Y.
Fred K. Lane, Seattle, Wash.
F. A. Leach, Jr., San Francisco, Calif.
Mr. and Mrs. H. O. Loebell, New York, N. Y.
Mr and Mrs. Donald MacArthur, Jersey City, N. J.
A. B. Macbeth, Los Angeles, Calif.
J. A. Mason, Baltimore, Md.
H. L. Masser, Los Angeles, Calif.
Mr. and Mrs. J. H. Maxon, Muncie, Ind.
Mr. and Mrs. Donald McDonald, New York, N. Y.
G. E. McKana, Chicago, Ill.
C. O. G. Miller, San Francisco, Calif.
B. J. Mullaney, Chicago, Ill.
Charles A. Munroe, Chicago, Ill.
L. N. Newbert, Oakland, Calif.
H. M. Papst, Portland, Ore.
T. V. Purcell and daughter, Chicago, Ill.
Mr. and Mrs. T. C. Ratcliffe, New York, N. Y.
C. S. Reed, New York, N. Y.
Mr. and Mrs. M. C. Robbins, New York, N. Y.
F. J. Schafer, Los Angeles, Calif.
F. W. Sperr, Jr., Pittsburgh, Pa.
Mr. and Mrs. A. F. Staniford, Brooklyn, N. Y.
J. L. Stone, Spokane, Wash.
Mr. and Mrs. A. B. Tenney, Boston, Mass.
W. B. Tuttle, San Antonio, Tex.
F. S. Wade, Los Angeles, Calif.
Frank Wills, San Francisco, Calif.
W. S. Yard, San Francisco, Calif.
D. J. Young, Tacoma, Wash.

Changes at Boulder Gas Company

On January 16 the Federal Gas Company of Boulder, Colorado, passed into the hands of the Henry L. Doherty Company. While the exact purchase price was not given, it is understood to be in the neighborhood of $300,000. When the transfer was made, Harry L. McClure, who has been the manager for 15 years, retired, the managerial reins being taken by Ralph B. Hubbard of the Public Service Company, Western division. Just whether or not this means that the gas and electrical properties of the Cities Service will be combined must be awaited for official declaration.

Cities Service Co. in December

Gross earnings of Cities Service Company for the 12 months ending with December 31, 1924, were $17,463,218, as compared with $16,602,562 in the corresponding period of the preceding year. In the same 12 months net earnings amounted to $16,773,744, as compared with $16,093,616. Net to stock and reserves was $14,845,774, which is 2.90 times the preferred stock dividends, as compared with $13,468,760 for the 12 months ending December 31, 1923, which was 2.70 times the preferred stock dividends.

Net to common stock and reserves was $9,736,077, equivalent to $21.14 a share on the average amount of common stock outstanding, as compared with $8,480,783, or $18.28 a share for the 12 months ending December 31, 1923.

Contracts Awarded

The Gas Machinery Company of Cleveland, Ohio, has obtained contract to construct a new eight-foot water gas apparatus in the works of the Palm Beach Gas Co., at West Palm Beach, Fla.

This new eight-foot set will be located alongside of the six-foot set that the Gas Machinery Company furnished in West Palm Beach a year ago and for which space was provided at that time.

The growth of the gas property in West Palm Beach has been phenomenal and the gas company is controlled by the Gas Engineering Service Company, of Battle Creek, Mich., of which Mr. F. W. Seymour is president.

Gas in the Philadelphia "Own Your Home" Exposition

The Gas Appliance Committee organized to supervise the gas division at the Philadelphia Licensed First Annual "Own Your Home" Exposition includes several new members since the first announcement was made to the trade magazines.

This committee now includes: Stanley Grady, secretary, Roberts & Mander Stove Co., chairman; C. E. Bartlett, president, Bartlett & Co.; R. W. Trump, Philadelphia Stove Co.; C. W. Wardell; J. B. Myers, United Gas Improvement Company; and L. R. Dutton, Philadelphia Sub. Gas & Electric Co., Jenkintown.

The Philadelphia Exposition will be held in the Commercial Museum from May 9 to 16, under the auspices of the Philadelphia Real Estate Board and an operating license issued by the National Association of Real Estate Boards, and is the third city on the circuit of four licensed expositions conducted by the same management in Chicago, New York City, Philadelphia and Buffalo.

New Rates for No. N. Y. Utilities

Albany, N. Y.—Northern New York Utilities, Inc., has filed a new classification providing for use of service through prepayment meters will be discontinued April 1, 1925, in city of Watertown; thereafter regular meter service only will be available. Effects no change in rate for gas consumed ($1.95 per M. cu. ft.; minimum charge 50c per month). This filing of new classification was done to take care of one particular customer who objected to prepayment meter being removed from his residence and installation of meter service.

Public Service Commission of N. Y. Membership Reduced

Albany, N. Y.—In the Senate the Republican leaders have reduced the size of the Public Service Commission this year from 14 to 12 members. This is the committee to which is referred measures re-

lating to regulation and control of public utilities, as well as amendments to the Public Service Commission law. The makeup of this important committee, so far as the Senate is concerned, is practically all new: Warren T. Thayer of Chauteaugay, a manufacturer, has been named chairman. Other members of the committee include William W. Campbell, lawyer, of Lockport; James L. Whitley, lawyer, Rochester; Perley A. Pitcher, lawyer, Watertown, a new member, but who has been for many years in public life; B. Gordon Wales, lawyer, Binghamton; Courtlandt Nicoll, lawyer, New York; Willis Wendell, banker, Amsterdam; William J. Hickey, lawyer, Buffalo; Jeremiah F. Twomey, pharmacist, of Brooklyn; Bernard Downing, accountant, of New York City; John J. Dunnigan, architect, The Bronx, and Daniel F. Farrell, manufacturer, Brooklyn, are the Democratic members. All of these latter were on the committee last year except Senator Downing, who was chairman of finance under the Democratic administration.

Rates Approved by N. Y. Public Service Commission

Albany, N. Y. — The Public Service Commission has approved rates of the Upper Hudson Electric and Railroad Company for gas service supplied in the village of Catskill, N. Y., to become effective January 17, 1925, providing rates as follows for use of service for industrial purposes for guaranteed consumption of not less than 30,000 cubic feet per month: First 30,000 cu. ft., $2.10 per thousand cu. ft.; all over 30,000 cu. ft. per month, $1.75 per thousand cu. ft.; minimum charge, $63 per month; discount for prompt payment, 10c per thousand cu. ft. Rates heretofore in effect: First 30,000 cu. ft., $2.35 per thousand cu. ft.; all over 30,000 cu. ft. per month, $1.85; minimum charge, $70.50 per month; discount for prompt payment, 10c per thousand cu. ft.

Schedules of the Utica Gas and Electric Company filed to become effective January 27, 1925, provide new classifications for use of service for house heating (available to consumers operating gas-fired boilers or gas-fired warm air furnaces), at block rates as follows: Within the Utica district (city of Utica, villages of New Hartford, Whitesboro, Yorkville and Frankfort; and towns of New Hartford and Whitestown, including hamlet of Deerfield): First 5,000 cu. ft. per month, $7.90; all over 5,000 cu. ft. per month, 79c per thousand cu. ft.; discount for prompt payment, 5 per cent; minimum charge, $7.50 per month, except that gas consumed during June, July, August and September will be billed as of one month. Within Herkimer district (city of Little Falls); villages of Ilion, Mohawk, Herkimer; towns of Frankfort, Schuyler, German Flat, Little Falls: First 5,000 cu. ft., per month, $8.42; all over 5,000 cu. ft., per month, 79c per thousand cu. ft.; discount for prompt payment, 5 per cent; July, August and September will be billed as one month.

New Gas Company in Maryland

Cumberland, Md.—The Cumberland and Allegheny Gas Company, recently formed, now replaces the West Virginia and Maryland Gas Company and its subsidiary and affiliated companies, which owned and operated the business of producing gas in West Virginia; the main pipe line from the fields to Cumberland and other cities in Maryland; and also to many towns in West Virginia. It also owned and operated the distribution plants in these cities in both states.

J. Alex. Mayers of Philadelphia, who has been identified with both manufactured and natural gas interests, has been appointed general manager of the new company and will take charge immediately, making Cumberland his headquarters, where the main office will be located. The operation of these plants will be under the direction of Sanderson & Porter, engineers, of New York City, for the Southern Gas and Power Company, of which the Cumberland and Allegheny Gas Company now becomes a subsidiary, as these properties have been purchased from the Buffalo interests by the Southern Gas and Power Corporation.

The company officials say they realize the fifty-fifty partnership between the company and the consumers and everything will be done to strengthen that partnership for the benefit of all.

The Officers of the Company

The officers of the new gas company are: Walter Whetstone, Philadelphia, president; Thomas B. Finan, Cumberland, vice-president; Frank Geaser, Philadelphia, secretary and treasurer; J. Alex Mayers, general manager.

J. Alex. Mayers, who has been appointed general manager of the Cumberland and Allegheny Gas Company, has had a wide experience in the production of natural gas and the manufacture of artificial gas and the distribution of both and is well and favorably known to the gas industry.

He was connected with such enterprises as the construction of the East River Gas Company tunnel under the Hudson River used for the delivery of gas to New York City from Long Island, it being the first tunnel bored under the Hudson River; development of the Consolidated Gas Company's plant on the Jersey shore of Long Branch; the extension of the Columbus, Ohio, Gas Company's plant; the distribution and manufacture of natural gas in the City of Detroit, Michigan; the drilling of wells in the Sugar Grove fields in Ohio and the piping of gas to Columbus; and construction of gas plants at Key West, Fla., San Juan, Porto Rico, West Brook, Maine, South Portland, Maine, and extensions of points in many other cities in the Eastern States, and started the first Natural Gas Magazine.

Mr. Mayers was prepared at Phillips Academy at Andover, Mass., and took the civil engineering course at Rensselaer at Troy, N. Y.

Kinston Gas Works to Start Up February 1

Kinston.—The Kinston Gas Co. will begin operations about February 1, Thomas Bland the manager has announced. The plant, located in the southwestern part of the city, has been completed, and pipes are being laid in various parts of the city. The works will have a daily capacity of 450-000 cubic feet, Bland stated, with facilities for the storage of a considerable reserve supply.